

CLAIMS:

1. A door closer for mounting between a door leaf and a door frame, the door closer comprising:

5 a housing for mounting in one of the door leaf or door frame, a biasing element disposed in and connected to the housing, and a chain, the chain having one end connected to the biasing element and another end for mounting to the other of the leaf or door frame, the chain comprising a plurality of link elements mutually connected together, each link element having two opposing ends, mutually spaced in the direction of the length of the chain, each end having a shoulder portion, and adjacent link elements having opposed shoulder portions which are adapted to abut when the adjacent link elements of the chain are bent around a particular arc or radius.

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2. A door closer according to claim 1, wherein the opposed shoulder portions have the same shape.
3. A door closer according to claim 1, wherein the shoulder portions are planar.
4. A door closer according to claim 3, wherein the shoulder portions are inclined relative to the transverse direction of the chain by an angle in the range from 5 to 30 degrees.
5. A door closer according to claim 4, wherein said angle is about 14 degrees.
6. A door closer according to claim 1, wherein the link elements have the same structure.
7. A door closer according to claim 1, wherein the link elements are separated longitudinally across the chain by at least one spacer element which pivotally connects adjacent link elements together.

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8. A door closer according to claim 7, comprising a plurality of spacer elements, each spacer element having two opposing ends, mutually spaced in the direction of the length of the chain, each end having a shoulder portion, and adjacent spacer elements having opposed shoulder portions which are adapted to abut when adjacent spacer elements of the chain are bent around a particular arc or radius.
 9. A door closer according to claim 8, wherein the opposed shoulder portions of said spacer elements have the same shape.
 10. A door closer according to claim 8, wherein the shoulders of said spacer elements are substantially planar.
 11. A door closer according to claim 10, wherein the shoulders are inclined relative to the transverse direction of the chain by an angle in the range from 5 to 30 degrees.
 12. A door closer according to claim 11, wherein said angle is about 14 degrees.
 13. A door closer according to claim 7, wherein the spacer elements have the same structure as the link elements.
 14. A door closer according to claim 7, comprising a chain with two or more rows of link elements interleaved by spacer elements.
 15. A door closer according to claim 14, wherein the width of the chain consists of three link elements and two spacer elements.
 16. A door closer according to claim 7, wherein a link element and/or a spacer element comprises one or more link plates.

17. A door closer according to claim 1, wherein said link elements are in the form of blocks, each block having two opposing faces, mutually spaced in the direction of the length of the chain, each face having a shoulder portion, and adjacent link elements having opposed shoulder portions which are adapted to abut when the adjacent blocks of the chain are bent around a particular arc or radius.

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18. A door closer according to claim 17, wherein said opposing faces comprise a male or female portion of a pivotal connection, and wherein adjacent blocks are pivotally connected through said male and female portions.

19. A door closer according to claim 17, wherein the opposing faces of each block are pivotally connected by a pin.

20. A door closer according claim 17, wherein the opposed shoulder portions have the same shape.

21. A door closer according to claim 17, wherein the shoulder portions are substantially planar.

22. A door closer according to claim 21, wherein the shoulder portions are inclined relative to the transverse directions of the chain by an angle in the range from 5 to 30 degrees.

23. A door closer according to claim 22, wherein said angle is about 14 degrees.

24. A door closer according to claim 17, wherein one of the said opposing faces of a given block comprises a female portion of a pivotal connection, and the other opposing face of the block comprises a male portion of a pivotal connection.

25. A door closer according to claim 18, wherein both male and female portions of the pivotal connection comprise a plurality of plates, and wherein the plates of a male portion interleave with the plates of a female portion to form a sandwich-type construction.
26. A door closer according to claim 25, wherein three plates of a male portion interleave with two plates of a female portion.

27. A door closer for mounting between a door leaf and a door frame, the door closer comprising:

5 a housing for mounting in one of the door leaf or door frame, a biasing element disposed in and connected to the housing, and a chain, the chain having one end connected to the biasing element and another end for mounting to the other of the leaf or door frame, the chain comprising a plurality of link blocks mutually connected together, each block having two opposing faces, mutually spaced in the direction of the length of the chain, wherein the opposing faces of each block comprise a male or female portion of a pivotal connection, and wherein adjacent blocks are pivotally connected through said male and female portions.

28. A door closer according to claim 27, wherein one of the said opposing faces of a given block comprises a female portion of a pivotal connection, and the other opposing face of the block comprises a male portion of a pivotal connection.

29. A door closer according to claim 27, wherein both male and female portions of the pivotal connection comprise a plurality of plates, and wherein the plates of a male portion interleave with the plates of a female portion to form a sandwich type construction.

30. A door closer according to claim 29, wherein three plates of a male portion interleave with two plates of a female portion.

31. A door closer substantially as hereinbefore described with reference to Figures 1-5, 6-8 and 9.